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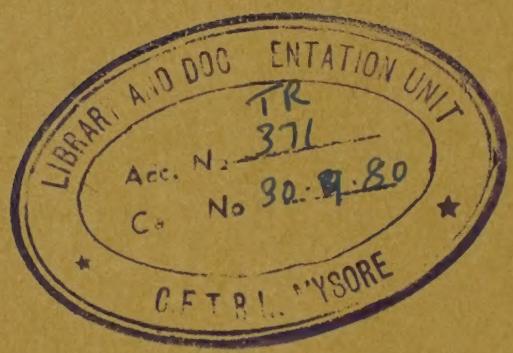
# Tropical Products Institute

Tropical Products Institute Report

Q51 Selected bibliography on cassava (*Manihot esculenta* Crantz)

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## PREFATORY NOTE

The Tropical Products Institute has in preparation a number of interrelated reports on the production, processing and marketing of cassava and cassava products.

This bibliography is the first in the series.

The Tropical Products Institute is a British Government organisation which helps developing countries to derive greater benefit from their renewable resources.

It specializes in post-harvest problems and will be pleased to answer requests for information and advice. Reports such as this one are often written as the result of an enquiry.

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## Introduction

The cassava plant *Manihot esculenta* Crantz, is known by many names, the most common of which are cassava in English speaking countries of Africa; manioc, manihot, mandioca and yuca in Latin America; tapioca in tropical Asia, and manioc in Francophone Africa. In European trade the terms 'manioc' and 'cassava' are usually applied to the dried (chips, roots, flour) or semi-processed root tubers and the products obtained by wet processing are called tapioca and tapioca starch. Moreover, in commercial practice, the terms starch and flour are very often used interchangeably. Botanically too there is some confusion. The valid taxon is *Manihot esculenta* Crantz, which is synonymous with the taxon *M. utilissima* Pohl. The latter, however, is still widely used, but as it is no longer valid, should now be discontinued.

Cassava is indigenous to tropical America and seems to have been in cultivation there for about four thousand years; it is now unknown in the wild state except as an escape. From South America, the plant has spread to tropical and sub-tropical regions all over the world, the main areas of culture being West Africa, East Africa, Brazil, India, Indonesia, Madagascar, Malaysia, Philippines and Thailand.

The plant is a perennial shrub which may reach a height of about 3 m. although the habit varies greatly between cultivars. The leaves are palmate and are often shed during dry periods with little apparent harm to the growth of the plant. The small apetalous flowers are borne in racemes near the ends of the branches, male and female flowers being borne on the same raceme. They are entomophilous. Female flowers are succeeded by three-seeded dehiscent capsules. The plant has a fibrous root system, but some of the roots develop into root tubers by process of secondary thickening. These tubers develop radially around the base of the plant and are the main economically useful part of the plant: they are used extensively as a starchy food in many tropical countries. The young leaves and shoots of cassava are rich in protein, vitamin and minerals. In some cassava growing regions they are consumed as a vegetable but their use is not very widespread.

Cassava thrives under various conditions of climates and soil types, and can withstand a certain period of drought. The relatively easy culture makes it a popular staple food crop in many parts of the world. However, it contains very little protein, around 1 per cent, and between 15 - 30 per cent of starch on a fresh-weight basis. It is thus essentially a carbohydrate food, and a cheap source of calories in the diet. So far as food production in the tropics is concerned, cassava is the most important single crop after rice. Production figures for 1967 are shown in the following table:

	<u>1967 Production</u> (thousands metric tons)
Latin America .....	32,783
Near East .....	130
Far East .....	19,323*
Africa .....	30,388
Oceania .....	115
World Total .....	82,739

(FAO Production Yearbook, 1968)

\*Excludes Mainland China whose production is estimated to be about 10 million tons.

For complex reasons, there has been a rapid increase in cassava growing in recent years. Nearly all the cassava in the world is produced by non-mechanised subsistence farmers to whom a most important factor is that cassava can produce more calories of food per unit input of labour than most other tropical crops. Naturally the plant benefits from good soil but it is extremely accommodating and produces reasonable yields even under adverse conditions. It is afflicted by few diseases, the most serious being mosaic virus (spread by a white fly, *Bemisia* spp.) which causes chlorosis and distortion of the leaves and may cause serious loss of yield or even death of young plants.

In addition to many food uses, dried cassava slices or chips are ground into coarse flour and used as a raw material for domestic and some industrial purposes e.g. animal feeding, starch, glucose and alcohol production. There is a substantial international trade in cassava chips and pellets for compound animal feedingstuffs.

Considering the use of cassava for food and industrial products, there is good reason to believe that the crop will continue to increase in importance. In view of the worldwide interest in different aspects of the plant and its applications, the following list of references has been compiled. This bibliography is by no means exhaustive as much of the material published on the crop consists of small notes of limited value, sometimes in literature difficult of access. It does, however, include most references of major value in the more accessible sources.

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